

new product
information

LX1684 VOLTAGE MODE PWM CONTROLLER

New Product Information and Sales Kit

Manufactured by:

Microsemi

Power Management Division

Garden Grove

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www.Microsemi.com

More than solutions – enabling possibilities

Introduction

CONFIDENTIAL INFORMATION

This new product introduction guide is intended for use only by Microsemi's sales people and authorized representatives and distributors. This material can be adapted for customer presentations, but the sales strategy and summary [pricing, availability, etc.] is confidential and should not be shown to customers

DESCRIPTION

The LX1684 is a voltage-mode pulse-width modulation controller. It was designed to provide a **flexible, low cost buck** (step-down) regulator supply with **minimal** external components in desktop applications.

The LX1684 has a **synchronous** driver for higher efficiency and is optimized to provide regulation from 12V supplies to 5V, 3.3V, or down to 2.5V outputs. It also can be used to provide regulation from 3.3V to as low as 1.25V.

The LX1684 is similar in functionality to the LX1682 with the additional of a current sense comparator input (CSP) referenced to the topside FET making the LX1684 more robust in 12V supply applications.

Under-voltage lockout and **soft-start** provide for optimal start-up performance. The dual functionality of the soft-start pin causes the LX1684 to enter a shutdown mode when pulled to ground. The PWM switching frequency is fixed at 175kHz making the LX1684 optimized for low-cost components. In addition short-circuit current limiting can be implemented without expensive current sense resistors.

Peak inductor current is sensed using the voltage drop across the $R_{DS(ON)}$ of the MOSFET — sensing is delayed for 1 μ s to eliminate MOSFET ringing errors. **Hiccup-mode fault protection** reduces average power to the power elements during short-circuit conditions.

The LX1684 is offered in a small 14-pin SOIC package reducing PCB board space.

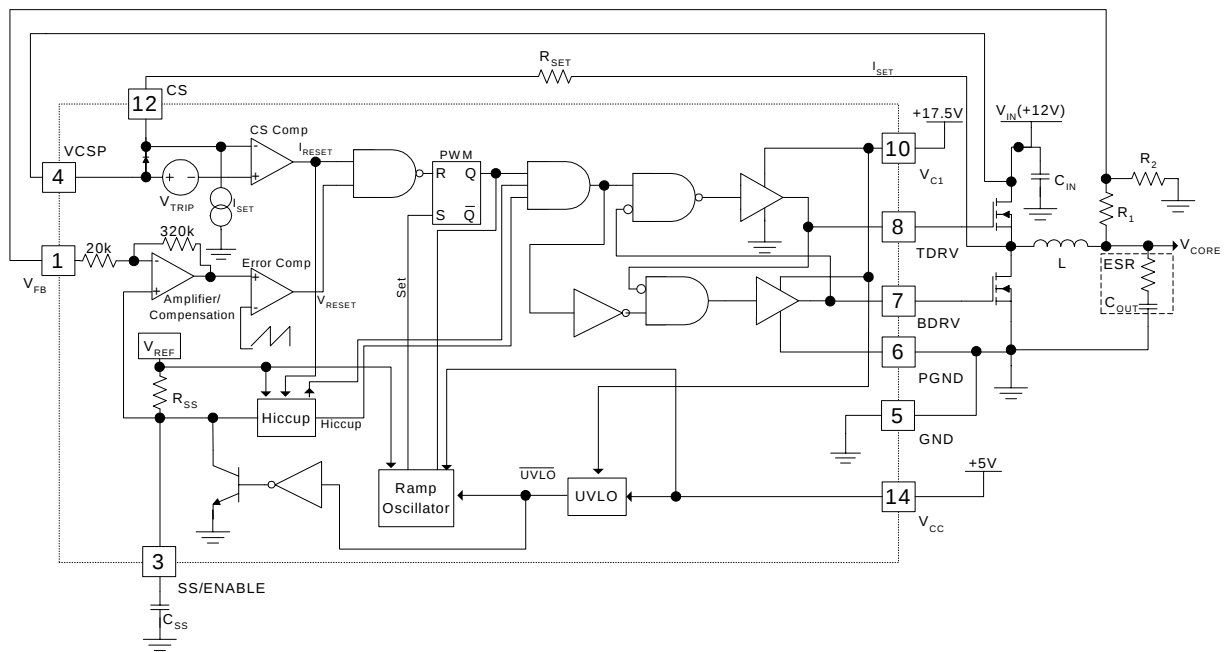
SUMMARY

The LX1684 is a low cost high efficiency switching regulator **optimized for 12V-to-5V, 3.3V, down to 2.5V** conversions, as well as **3.3V to sub 2V**.



Key Product Information

BLOCK DIAGRAM

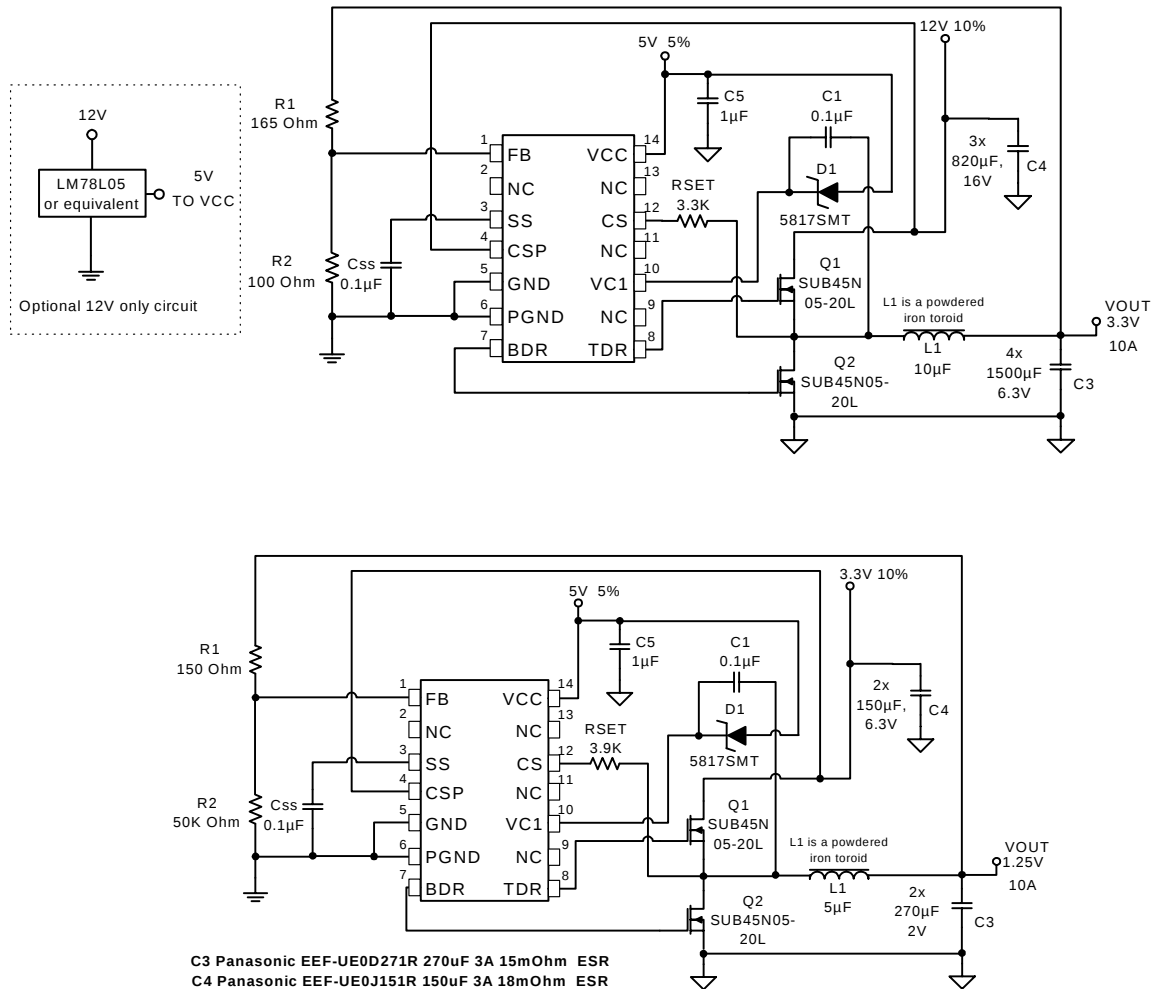


KEY FEATURES

- Fixed 175kHz Switching Frequency
- Constant Frequency Voltage-Mode Control Requires NO External Compensation
- Hiccup-Mode Over-Current Protection
- High Efficiency
- Adjustable Output Voltage Set By Resistor Divider
- Under-Voltage Lockout
- Soft-Start And Enable
- Synchronous Rectification
- Small, 14-pin Surface Mount Package



TYPICAL APPLICATIONS



APPLICATIONS

- 12V to 3.3V Or Less Buck Regulators
- Microprocessor Core Supplies
- Hard Disk Drives
- General 3.3V Supplies
- Computer Add-on Cards
- General Purpose DC:DC Conversion
- Graphic Cards



Competitive Analysis

LX1684

Competitor	Device	V _{C1} Range	V _{REF} Tolerance ±	OSC Frequency	Temperature Range	Notes
Microsemi	LX1684	3 – 16V	1.25V 1%	175 KHz	0 – 70°C	
Semtech	SC1102	4.2 – 12.6V	1.265V 1%	200 KHz	0 – 70°C	Not pin to pin compatible

Alternative Microsemi Solutions

Device	Description	Notes
LX155x UC384xA	Current-Mode PWM	• Difficult to implement current limit • Low Cost • 2.5V reference

Sales Strategy

FIND SOCKETS

- PC manufacturers
- Graphics Card Manufacturers
- Embedded and industrial CPU boards
- Users of high performance memory and multimedia processors

POSITIONING

- Sell the LX1684 as a low parts count solution
- Sell the added efficiency of the synchronous controller
- Sell the protection features – hiccup mode current limiting; under voltage lockout; soft-start
- Find the need for a voltage conversion from a 12V supply when a 5V power supply is unavailable

IMPORTANT FACTS TO REMEMBER

- The LX1684 is a proprietary pin-out
- The LX1682 can be used for high current conversion from 5V supplies to 3.3V or less outputs
- Look for desktop computer applications



Summary

Pricing

Device	Package	Commercial (0 to 70°C)	
		DC	1000+
LX1684	14 pin SOIC	\$0.89	\$0.97

Availability

Samples: NOW
Production: 9/15/01

Options

Temperature: C Commercial 0 to 70°C
Packages: D SOIC 14-Pin Tape and Reel [MOQ 3000pcs]

Technical Support

Datasheet: See Microsemi's website
Application Note: See Datasheet
Evaluation Board: LXE1684

Factory Contacts

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